United Nations A/61/696

General Assembly

Distr.: General
12 January 2007

Original: English

Sixty-first session
Agenda item 17
The situation in the occupied territories of Azerbaijan

Letter dated 20 December 2006 from the Permanent Representative of Belgium to the United Nations addressed to the Secretary-General

I have the pleasure of transmitting to you the report of the environmental assessment mission led by the Organization for Security and Cooperation in Europe (OSCE) to the fire-affected territories in and around the Nagorno-Karabakh region, which was conducted from 2 to 13 October 2006 (see annex).

The mandate of the mission was based on the terms of reference agreed with Armenia and Azerbaijan on 25 September 2006 and confirmed by an exchange of letters between Karel De Gucht, Chairman in Office of OSCE and Minister of Foreign Affairs of Belgium, and the Ministers for Foreign Affairs of Armenia and Azerbaijan.

As specifically agreed, the mandate of the mission was to assess the short-term and long-term impact of the fires of summer 2006 on the environment in the fire-affected territories and to make recommendations on how to counteract any detrimental impact of the fires and on an environmental operation as envisaged by General Assembly resolution 60/285.

I would be grateful if you could circulate the present letter and its annex to the members of the General Assembly under agenda item 17.

(*Signed*) Johan **Verbeke**
Ambassador
Permanent Representative

07-20860 (E) 260107

Annex to the letter dated 20 December 2006 from the Permanent Representative of Belgium to the United Nations addressed to the Secretary-General

OSCE-led Environmental Assessment Mission to fire-affected territories in and around the Nagorno-Karabakh region

Report to the OSCE Chairman-in-Office from the Coordinator of OSCE Economic and Environmental Activities

1. Introduction

During the period of June-September 2006, extended wildland fires affected territories situated close to the Line of Contact (LoC) in and around the Nagorno-Karabakh region. Reports of unusually heavy precipitation during the winter months combined with dry and hot weather in early spring created ideal conditions for the occurrence of early-season fires, characterized by high intensities and fast spread. The fires resulted in environmental and economic damages and threatened human health and security. In some places the lack of adequate equipment and expertise in wildfire suppression did not allow the local population, fire services and security forces to contain the fires. Additional impediments to control the fires included the threat of landmines and unexploded ordnance in the area affected by fires, as well as the general tensions between armed forces along the LoC.

The mandate of the Mission was based on the Terms of Reference agreed with Armenia and Azerbaijan on 25 September 2006, and confirmed by an exchange of letters between the OSCE Chairman-in-Office, Minister of Foreign Affairs of Belgium Karel De Gucht, and the Ministers of Foreign Affairs of Armenia and Azerbaijan. As specifically agreed, the Mandate was to assess the short-term and long-term impact of the fires on the environment in the fire-affected territories, to make recommendations on how to counteract any detrimental impact of the fires and on an environmental operation, as foreseen in the UN General Assembly Resolution A/RES/60/285 "The Situation in the Occupied Territories of Azerbaijan" (September 7, 2006).

Concerns over the impact of the fires in the affected territories also led to discussions in the UN General Assembly resulting in the adoption of the UN General Assembly Resolution. The Resolution takes note of the intention of the Organization for Security and Cooperation in Europe (OSCE) to assess the short-term and long-term impact of the fires on the environment as a step in preparation for the environmental operation. The Resolution stresses the necessity to urgently conduct an environmental operation to suppress fires in the affected territories and to overcome their detrimental consequences. The Resolution calls upon the organizations and programmes of the United Nations system, in particular the United Nations Environmental Programme, in cooperation with the OSCE, to provide all necessary assistance and expertise, including, inter-alia, the assessment of and counteraction to the short- and long-term impact of the environmental degradation of the region, as well as its rehabilitation. The Resolution welcomes the readiness of the parties to cooperate to that end, and considers such an operation to be an important confidence-building measure. The Resolution requests the OSCE Chairman-in-Office to provide a Report on this matter to UN Member States before April 30, 2007.

In fulfilment of the OSCE Mandate based on the Terms of Reference agreed on September 25, 2006 between Armenia and Azerbaijan, I led, in my capacity of Co-ordinator of OSCE Economic and Environmental Activities, the Environmental Assessment Mission ("the Mission") to the fire-affected territories.

The originality of the Mission was that it could draw on the assistance and the expertise not only of international experts but also of local experts appointed by the authorities of the parties in (approximately) equal number. Moreover, all Mission participants benefited of the same security guarantees when visiting both sides of the Line of Contact.

On the international side, the Mission could benefit from the assistance and expertise of:

- Three representatives of the Global Fire Monitoring Center (GFMC), a Center affiliated with the United Nations International Strategy for Disaster Reduction (UNISDR); they became involved as partners of the Joint Environment Unit of the United Nations Environment Programme (UNEP) and the United Nations office for the Co-ordination of the Humanitarian Affairs (OCHA);
- Two representatives from UNEP;
- One Civil Protection Expert, designated by the Council of the European Union (General Secretariat, Civilian Crisis Management Directorate);
- One expert on disaster interventions designated by the European Commission;
- The Executive Secretary of the Council of Europe's "European and Mediterranean Major Hazards Agreement (EUR-OPA)";
- Three representatives of the OSCE Secretariat; and
- Two liaison officers of the Office of the Personal Representative of the OSCE Chairman-in-Office on the Conflict dealt with by the OSCE Minsk Conference (one liaison officer for each side of the Line of Contact).

The Mission could draw from the findings of the "Report on Fires affecting Areas close to the LoC" prepared in July 2006 by the Personal Representative of the OSCE Chairman-in-Office on the Conflict Dealt with by the OSCE Minsk Conference.

The Mission's report is based on the Experts' Technical Report and Documentation drafted by the Global Fire Monitoring Center with inputs from all Mission members, including national and local agencies involved in the preparation, implementation, and reporting of the Mission.

The Mission was supported by a core financial contribution of the Environment and Security Initiative (ENVSEC) whose mandate promotes understanding of the linkages between environmental issues and human security. Further in-kind contributions for the Mission were provided by the Governments of Armenia and Azerbaijan.

2. Brief Narrative of the Mission and Mission Itinerary

The international experts assembled in Baku, Azerbaijan, on 3 October 2006 and took part in a briefing in the Ministry of Foreign Affairs of Azerbaijan. They were received by Mr. Araz Azimov, Deputy Minister of Foreign Affairs, who had invited representatives of all the Azerbaijani Ministries and Agencies involved in the preparation of the Mission. Presentations were provided on the impact of fires as assessed by their respective Ministries and Agencies. A summary of these presentations was provided to the Mission in English and Azerbaijani languages and constituted an important reference for its assessment of the impact of the fires.

On 4 October, the international experts and the local experts nominated by the Azerbaijani authorities, travelled from Baku to Ganja, where they were to be joined by the local experts nominated by the Armenian authorities.

On 5 October, the Mission travelled from Ganja to the southernmost fire affected areas. The Mission met in Horadiz the Head of the Executive Authority of the Fizuli district. Due to their late arrival in Ganja, the experts nominated by the Armenian authorities could not participate in the meeting. However, together with the international experts and the other local experts, they could participate in the first examination and assessment of the fire affected areas at Site 1, near the village of Ashagi Seyidakhmedli. From trenches of the Azerbaijani army, the Mission could observe fire affected areas in the direction of that village, with an abandoned wine-factory as a landmark. In the evening a briefing meeting took place with the Head of the Executive Authority of the Agdzhabedi district.

On 6 October, the Mission returned to the South to observe fire affected areas, mostly pastures, from two sites (Sites 2 and 3) in the Khojavend/Martuni area. A briefing was provided by the Head of the Executive Authority of the Agdam district, who accompanied the Mission to Site 4, near the village of Chemenli, allowing the viewing of fire affected areas, including agricultural land, in the direction of Agdam. At the end of the day, the Mission travelled to Terter, where it received a briefing from the Head of the Executive Authority of the Terter district on fires in that district, including the viewing of a documentary film.

On 7 October, the Mission went back to the Terter district to observe, sometimes at a close distance and sometimes from afar, fire affected areas, and to examine and assess the environmental impact of fires from Sites 5 and 6. In the afternoon the Mission travelled directly to the border between Azerbaijan and Georgia. In the evening, the Mission reached Tbilisi.

On 8 October, the Mission travelled from Tbilisi to Stepanakert/Khankendi, with a stopover in Yerevan.

On 9 October, the international experts and the local experts nominated by the Armenian authorities participated in a briefing meeting with the "Nagorno-Karabakh authorities". These "authorities" provided their views on the fires, stressing how much the fire had been a matter of concern, and the various measures that had been taken. The text of the presentation they gave was made available in Russian and English languages to the Mission and constituted an important reference for its assessment of the impact of the fires.

After this briefing meeting, the entire Mission headed towards the districts of Hadrut and Horadiz to examine fire affected areas. The Mission had a briefing

meeting by the Head of the Administration of Hadrut district. In the afternoon fire affected areas were observed by the Mission, although, for security reasons, the Mission could not observe the same fire affected areas as the ones it had observed from Site 1 on the other side of the Line of Contact.

On 10 October, the Mission travelled to the Agdam district. The Mission could approach the Line of Contact much more closely than the preceding day and see some of the crop and pasture land worst affected by the fires from several sites, including Saybaly.

On 11 October, the Mission visited fire affected areas in the district of Martakert/Agdere. Briefings were provided to the Mission by several heads of local administration as well as by the "Head of the Regional Administration of Martakert/Agdere".

Between 9 and 12 October, the full Mission, including all the local experts, assembled several times to discuss the format and the focus of the report, which would be fully in line with the Mission's mandate.

In the morning of 12 October, the international experts and the local experts nominated by the Government of Azerbaijan left Stepanakert/Khankendi in the direction of Yerevan. After arriving in Yerevan, they were received at the Ministry of Foreign Affairs of the Republic of Armenia for a debriefing session. Officials of the Ministry of Foreign Affairs expressed interest and support for the Mission. With the departure of most of the international experts and the local experts nominated by the Government of Azerbaijan, the field Mission was terminated on 13 October 2006.

3. Assessment

3.1 Conditions that have fostered the fires

As documented in the Experts' Technical Report, information on the occurrence and impact of wildland fires is rather limited in the South Caucasus region. Nevertheless, on the basis of official reports published in both Azerbaijan and Armenia as well as satellite observations and ground evidence, the Mission has concluded that fires have affected the territories on both sides of the Line of Contact in the years before 2006.

The severity of the fires that have taken place in the summer of 2006 was, however, exceptional. Temperature was above the long-term average and rainfall below the norm. As a consequence of the drought conditions, the water volume in the rivers flowing from the Nagorno-Karabakh uplands to the lowlands was also below average.

While hot, dry and windy weather created high fire-danger conditions favourable for the ignition and spread of fires from numerous sources over the whole fire season, the intensity and type of land use also had an influence on fire hazard and size of the wildfires.

According to the reports of the Azerbaijani authorities, the fires affected only to a relatively limited extent the hinterland on the eastern side of the Line of Contact. The main areas affected by fires were located in the vicinity of the Line of Contact and concerned areas closed to public access and/or where agricultural activity had been abandoned due to security risk as well as the no-man's land itself.

On the western side of the Line of Contact, the Mission could observe territories on which tenancy rights have been granted to farmers for agricultural purposes by the "authorities of Nagorno-Karabakh" and that have been visibly affected by fires.

High-resolution satellite images obtained by the Mission reveal that the typical cultivated croplands and pastures are more fragmented east than west of the Line of Contact. With more intensive cultivation, smaller pieces of land and the permanent presence of local population, uncontrolled fires apparently did not spread as easily over large areas in the east as compared to the large complexes of less cultivated lands in the west.

Also in the west, abandoned pasture or cultivated land, including abandoned vineyards, orchards and winter pastureland, provided favourable conditions for the spread of wildfires due both to the larger, non-fragmented size of vegetation units and the accumulation of combustible materials as a consequence of abandonment and vegetation succession in some sites.

Increasing accumulation of combustible materials (fuel load) is also affecting the behaviour and the controllability of wildfires. Accumulated fuels lead to an increase of fire intensity and the rate of spread of wildfires that are more difficult to control as compared to fires burning in vegetation with low fuel loads.

Photographic evidence reveals that abandoned villages and towns were also becoming susceptible to wildfires due to encroachment and accumulation of vegetation. From what the Mission could see, however, the fires that might have reached abandoned villages or towns did not cause significant additional damages to structures that had already suffered from the conflict.

3.2 Fire Causes and Fire Behaviour

While the above conditions provided the prerequisites for the intensity and spread of wildfires, the ignition of fires was most likely due to human causes (there was no report of fires ignited by a lightning storm). Over the summer period, it appears that many different fires started at different places, at different times and for different reasons in the fire affected territories. The most likely causes of fires in the region on both sides of the LoC included:

- traditional burning of post-harvest residuals on croplands (stubble burning); although stubble burning is officially forbidden, it appears to be practiced on both sides of the Line of Contact);
- military activities, in particular shooting incidents where tracer bullets have been used, which may ignite grass under dry conditions;
- accidental ignitions due to imprudence or negligence.

Reports on fire behaviour in the territories close to the Line of Contact and in the mountainous region of Nagorno-Karabakh stated unanimously that the intensity and spread of fires was extremely high and made the control of fires difficult. Warm and dry winds associated with high fuel loads resulted in spot fires which crossed roads, empty irrigation channels and the trenches along the line of contact. Evidence of this extreme fire behaviour was identified by the mission.

An additional factor is related to the particular topographic features in the mountainous terrain of Nagorno-Karabakh: the dominant wind during daytime is

blowing from east to west, i.e. from the plains to the mountains; as a result, fires that originated in the lowlands have been spreading uphill rather fast, the rate of fire spread being directly related to the steepness of the slope. Difficult access and lack of mobile fire fighting equipment were further reasons why the fires in mountainous terrains were extremely difficult to control.

3.3 Extent of the Fires

High-resolution satellite imagery shows that the fires have affected extensive areas along the about 100 km of the line of contact that runs from the Iranian border in the south to the region of Terter in the north (thereafter it turns to the west and joins a mountainous region).

A detailed assessment of what the Mission could observe at specific points on both sides of the line of contact is provided in the Experts' Technical Report and Documentation.

According to the Azerbaijani authorities, in total about 63,000 hectares of land were burned by the fires, including about 9,000 hectares in the Fizuli district, about 15,000 hectares in the Khojavend/Martuni district, about 17,000 hectares in the Agdam district, about 1,000 hectares in the Terter district and 3,000 hectares in Agdere/Martakert district. These estimates include not only areas under various forms of cultivation and pastures but also wild land, which might have valuable flora and fauna.

Different estimates were provided by the "authorities of Nagorno-Karabakh", which state that about 2,000 hectares of grain crops and about 11,000 hectares of pastures were burned. Fire has also burned some forest areas on the slope of the hills although no specific estimates of the areas concerned were provided. More limited areas of vineyards, orchards and mulberry groves have been damaged.

While the Mission was not in a position to verify the exact size of all fire-affected areas in detail, its observations confirm the overall size of burned area as depicted by satellite sensors along the LoC as well as the seriousness of the fires and their significant impact. The Mission noted that areas burned further west of the LoC, in particular in the foothills and in the uplands of Nagorno-Karabakh, were not included in the satellite-based assessments. Thus, the total size of vegetation affected by fire in 2006 in the whole region is considerably larger (size potentially to be determined in a remote sensing study).

3.4 Fire Management Capabilities

The team was not given the opportunity to visit fire-fighting installations east of the LoC. However, in several occasions Azerbaijani representatives emphasized that their means and equipment were up to date and capable of intervening against fires. In their view, the only obstacle was represented by the danger of intervening in areas adjacent to the Line of Contact, due to the possible firing incidents and the threat by minefields and unexploded ordnance.

In Nagorno-Karabakh, the Mission visited several fire stations. This allowed the drawing of a bleak picture of the situation in all stations, with obsolete 20-25 years old fire trucks of Soviet Union origin and equally obsolete equipment.

An aggravating factor for rapid response to fire is the mountainous terrain of Nagorno-Karabakh with its limited accessibility by fire vehicles. There is also a lack of adequate tools for ground forces, especially a lack of hand tools that are needed in terrain which can be accessed only by walking.

Another source of concern is the scarcity of water to fight fires, due, among others, to the absence of a functioning irrigation system, the deterioration or destruction of artesian wells and the lack of agreement and cooperation between authorities on both sides of the LoC on how to manage the scarce existing water resources.

3.5 Fire Impact on Ecosystems (vegetation, fauna, biodiversity)

3.5.1 Vegetation

A wide range of ecosystems were visited by the Mission, ranging from intensively cultivated land-use systems (grain fields, vineyards, orchards, etc.) to extensively managed agricultural and pastoral systems.

The degradation of vegetation in the lowlands, the foothills of the mountain edge and the forested or partially forested region in the higher elevations (ca. 400 m above sea level) is the result of the combined effects of long-term alterations, over-utilization of ecosystems, non-sustainable land-use systems as well as the impacts of recurrent fires.

Besides the fire damages to intensively cultivated agro-ecosystems, large areas of pastures and bush lands with remnants of degraded natural vegetation cover have been affected by fire.

The Mission was able to monitor the fresh growth of post-fire grass, herb and shrub vegetation. However, the "green appearance" of fresh post-fire vegetation may lead to wrong conclusions. Re-sprouting of selected fire-adapted or fire-tolerant grasses may go along with successive reduction or elimination of fire sensitive species. This kind of fire-induced or fire-accelerated process of ecosystem and biodiversity impoverishment should be monitored by careful scientific investigations.

3.5.2 Soil cover

Most striking is the visible effect of post-fire soil denudation. As was pointed out in the report by the Azerbaijani authorities, the destruction of the humus layers, exposing the soil to the mechanical affects of rain and wind erosion as well as to the effects of trampling by cattle will certainly lead to a loss of fertility and an overall loss of topsoil.

3.5.3 Biodiversity

The impact of fire on biodiversity – in the long run – can be considered detrimental. Although it is known that certain insect and reptile species are promoted by fire effects (through the creation of open habitats by fire), the denudation of large tracts of land from shrub, bush, herb and tree cover is considered a severe loss of plant diversity, and indirectly also of diversity of fauna. There is a threat that fires would penetrate fire-sensitive mountain broadleaved forests – a phenomenon that has been observed by the Mission in Nagorno-Karabakh.

3.6 Fire Impact on Economy, Human Livelihoods and Well-Being

Information provided by the "authorities of Nagorno-Karabakh" and by media from Azerbaijan include some figures on economic damages caused by the fires. In Nagorno-Karabakh, the economic damages were assessed to be in the magnitude of 3.5 billion Armenian Drams (about $US 9 million). The Head of the Administration of Terter district reported that 10,548 families had been affected by the fires. A press report from Azerbaijan provided a damage assessment of 7.5 million New Azerbaijani Manats (about $US 8.6 million).

Personal losses of farmers included: loss of crops destroyed by fire; expected losses due to the large-scale burning of winter pastures; and losses of crops or costs for rodenticides inflicted by reported massive migration of rodents from burned lands to agricultural as well as inhabited lands. These losses could be quite high in individual cases.

No assessments were made by the authorities to quantify the economic damages as a consequence of ecosystem degradation.

3.7 Fire Impact on Human Health and Security

General human health hazard was reported from several locations on extended smoke cover originating in the regions affected by fire. Local military commanders confirmed reduced visibility due to long-lasting smoke pollution episodes between June and September. The Head of the Administration of the Agdzhabedi district confirmed that the health of people with chronic asthma and cardiovascular diseases and elderly people was affected by smoke pollution.

The threat of human health by smoke pollution from vegetation fires is often not noted and thus undervalued. It is a well-known fact that the above-mentioned groups of elderly people affected by chronic diseases and children are most vulnerable to fire smoke pollution. Inhaled fine soot particles are considered a cause of lung cancer.

In the military conflict zone, the wildfires involved additional threats of human security. Most important is the threat of fire-triggered explosions of land mines and unexploded ordnances (UXOs). Mines and UXOs exploding during wildfires have been reported repeatedly and have restricted the use of ground forces to suppress fires in these critical zones.

Cases of fire trucks hit by bullets have been reported in the Terter district as well as in Nagorno-Karabakh. The Mission could see traces of bullets on two fire trucks in Nagorno-Karabakh.

The Heads of the Administration of Terter and Agdzhabedi districts reported an increase of snakebites, with about 48 people treated in hospitals. Locally it was stressed repeatedly that this phenomenon was a consequence of the migration of snakes (as well as rodents) driven by fire out of the nutrition-depleted burned areas.

3.8 Fire impact on atmosphere and climate

During the public discussion of the fire effects on the environment it was repeatedly stressed that the fires would have negative impacts on the composition and functioning of the atmosphere and would contribute to climate change.

In comparison with the emissions generated globally by vegetation fires burning (ca. 200 to 350 million hectares per year), the emissions released from a total area burned in the region in the magnitude of up to 63,000 hectares account for a very small share in total emissions.

However, the fact that repeated wildfires – in combination with land-use change – are contributing to the depletion of the natural vegetation cover is a reason for serious concern. The medium- to long-term consequences of repeated fires are creeping but steadily increasing and result in the depletion of forest and other woody and shrubby vegetation. This vegetation is not only important from the point of view of biodiversity and soil stability. It constitutes an important pool of terrestrial carbon, which, through the degradation effects of recurrent wildfires, will be irreversibly released in the form of trace gases to the atmosphere, thus successively contributing to an increase of atmospheric carbon and the human-induced global "greenhouse effect".

3.9 Related environmental concerns

A number of environmental problems arising from land use, land-use change and the influence of climate variability and uncontrolled processes such as wildfires are inter-related or interacting. Areas depleted of woody vegetation cover by fuel wood cutting, excessive logging or overgrazing are becoming increasingly susceptible to fire, especially in extreme drought periods.

During the Soviet period, the land-use system in the lowlands of Azerbaijan east of the Lesser Caucasus Mountains has been largely modified by intensive irrigation. Most of the irrigation infrastructure built during the Soviet period, however, is now in poor condition as result, among others, of inadequate public investment and maintenance over the last 15 years. As a result, irrigation use is experiencing a steady decline.

Furthermore, as a consequence of the conflict, the territories east of the foothills of Nagorno-Karabakh have been cut off from water supply from the mountains, notably from the Sarsang water reservoir. The Sarsang water reservoir was put into commission in 1976. According to the report provided by Azerbaijani authorities to the Mission, the capacity of the reservoir amounts to 565 million cubic meters. Prior to the conflict the reservoir used to provide water for irrigation of 100,000 hectares of lands both east and west of the LoC. The majority of the irrigation infrastructure was either destroyed during the fighting or degraded in the years after the military operations.

Before the armed conflict the irrigation canals were used for water collection for fire-suppression and served also as natural barriers for fire expansion. The degradation of water canals and the overall desiccation of the lowlands around the LoC allowed spotting fires to cross empty irrigation canals.

4. Recommendations

The Mission has been tasked to make recommendations on how to counteract any detrimental impacts of the fires and on an environmental operation as stated in the Mandate. The recommendations of the Mission consist in the implementation of a number of complementary actions or projects, in particular:

I. Short-term Initiatives

- Technical Meeting on Mission Report
- Fire Management Technologies and Planning
- Water Resources Management Workshop

II. Medium- to Long-term Initiatives

- Rehabilitation, including Reforestation, of Lands Affected by the Fires;
- Capacity Building, whenever possible on a joint basis between entities on both sides of the LoC, in three key areas:
  - Fire Management Planning;
  - Fire Prevention and Preparedness, and
  - Fire Suppression
- Modernization of Equipment
- Joint Fire Research
- Regional Co-operation in Fire Management, Water Management and related Environmental Measures.

These recommendations are aimed primarily at the relevant authorities of Azerbaijan and in Nagorno-Karabakh. However, the OSCE, the UN system and its partners, notably the United Nations Environment Programme (UNEP), the UNEP-OCHA Joint Environment Unit, the Global Fire Monitoring Center (GFMC) and the Global Wildland Fire Network (both affiliated with the UN International Strategy for Disaster Reduction–UNISDR) as well as bilateral and multilateral donors, are also invited to swiftly respond to the recommendations and provide support to their implementation in accordance with the needs highlighted in this report and the requests unanimously formulated by the members of the Mission nominated by the Azerbaijani and the Armenian authorities.

Besides rehabilitation of lands affected by fires, the overall aim of the recommended measures is to reduce the occurrence and impacts of wildfires in the future. Measures of an integrated character are also recommended such as the restoration of abandoned water supply and irrigation systems of which local populations and economies as well as fire management will benefit.

All recommended actions should be embedded, at local, regional and national level, into policy frameworks that ensure sustainability, in particular as concerns:

- land use (agriculture, pastoralism, forestry)
- water management
- nature/biodiversity protection

- combat of desertification
- greenhouse gas reduction/carbon sequestration
- human health and security
- poverty alleviation

Consultative processes to define more precisely the packages of measures recommended and projects to realize them should have a multi-stakeholder nature and include dialogue between authorities on both sides of the LoC since the policies, measures and projects will address problems that are not restricted to administrative or political boundaries or to the LoC.

Many of the following recommended actions could be further elaborated and implemented under the auspices of the OSCE and, where appropriate, in the framework of the Environment and Security Initiative (ENVSEC).

4.1 Short-term initiatives

The Mission believes that it is extremely important to immediately build upon the goodwill that was created by the Mission, involving local experts from both sides of the LoC. With highest priority, three capacity-building and information exchange meetings at the regional level should be conducted. These meetings together would serve, first and foremost, to allow the concerned parties to prioritize interests and actions based on the findings of the Mission Report. Furthermore, these workshops would help mobilize local, national, regional, and international instruments and resources prior to the beginning of the summer fire season in 2007. The meetings would benefit from the inclusion of the countries of the South Caucasus and adjoining regions that are faced with similar problems, and have developed capacities and are willing to share experience in fire management.

4.1.1 Technical Meeting on Mission Report

The findings of the Mission Report should be discussed at a technical-level meeting as soon as possible as a follow-up to the environmental assessment mission. A confidence-building process would benefit from an immediate follow-up discussion of some of the details and recommendations provided in the Report with those affected and concerned, first and foremost, with the local experts participating in the Mission and additional governmental representatives, as well as representatives from academia and civil society.

The Technical Meeting will serve to prioritize and agree upon technically needed and feasible actions to enhance local capacities in the short-term and also elaborate upon the feasibility of the broader recommendations.

Such a meeting could be organized under the auspices of the OSCE with the participation of local and international experts, and potentially within the framework of the Environment and Security Initiative (ENVSEC).

4.1.2 Fire Management Technologies and Planning

A fire management workshop should be organised, aimed at providing basic knowledge and tools for decision makers of administrations as a foundation for targeted and specific planning of fire management measures.

The fire management workshop would (a) provide the technical and scientific information that decision makers require for assessing local and national gaps and requirements for fire management planning, and (b) based on the finding of the Experts' Technical Report and Documentation drafted by the GFMC, elaborate on the draft proposed investment plan indicated in the Experts' Technical Report.

This workshop could be conducted as an activity of the enlarged UNISDR Regional South East European/Caucasus Wildland Fire Network. The network is coordinated by the University of Skopje, FYR of Macedonia, and is a regional activity of the Global Wildland Fire Network. These networks are an outreach programme of the UNISDR, coordinated by the GFMC. The joint participation of experts from Southern Europe as well as from the South Caucasus would provide an excellent opportunity for regional cooperation in fire management. An initial proposal presented by the GFMC to the Council of Europe in June 2006 was based on the lessons learned of confidence-building measures in the Balkan region and between Turkey and Georgia.

The Mission recommends that the Workshop be conducted as soon as possible (ca. February-March 2007).

Following the fire management workshop, experts from the region would have the further opportunity to participate in the already scheduled session of the UNISDR Regional South Eastern European/Caucasus Wildland Fire Network and the plenary meeting of the Global Wildland Fire Network at the upcoming 4th International Wildland Fire Conference (Sevilla, Spain, 13-17 May 2007).

In this conference all Regional Wildland Fire Networks of the Global Wildland Fire Network will meet and are expected to adopt, among others, the Fire Management Code (an international voluntary code of ethics and conduct currently prepared under the auspices of UN-FAO). The latter instrument would be a high priority item to be discussed as an internationally accepted guide towards cooperation and confidence building. It would be extremely important to support the participation of experts of the South Caucasus region in the Sevilla conference in order to ensure their understanding, acceptance and implementation of the Fire Management Code.

Both workshops could be sponsored by the OSCE and the UNEP for all participants of SE Europe and the South Caucasus as a broader measure of confidence and stability building in the region.

4.1.3 Water Resources Management Workshop

Given the high priority of cooperation in water resources management along the LoC, the Mission proposes that a workshop be organized as soon as possible in the beginning of 2007, aimed at defining how the process of restoration of the transboundary water management system across the LoC could be initiated and to address related urgent issues in the areas of nature conservation and sustainable forest management.

Such an initial workshop could take place under the auspices of the OSCE in the framework of ENVSEC, and with the further expertise of the United Nations Environment Program.

All pre-existing material on water management, particularly as concerns the Sarsang reservoir and the use of the Terter river water, should be urgently collected by the

ENVSEC partner organizations as a preparation for this workshop, including proposals formulated in 2001 by the Personal Representative of the Chairman-in-Office on the Conflict Dealt with by the OSCE Minsk Conference.

Furthermore, following on the example of the Mission, a second Mission, involving both international and local experts dealing with water management issues, could undertake joint visits to the sites concerned on both sides of the Line of Contact.

4.2 Medium- and Long-Term Initiatives

4.2.1 Rehabilitation, including Reforestation, of Lands Affected by Fires

The fire-induced degradation of vegetation, especially in the mountains, must urgently be halted. The development of a medium- to long-term strategy for rehabilitation of fire-affected lands must be prioritized in those sites where vegetation denudation is leading to increasing surface runoff of water, loss of topsoil by erosion, loss of fertility and an increase of secondary disasters, e.g. flooding, landslides or mudslides during extreme rainfall events.

There is considerable relevant experience in countries in the Black Sea and Eastern Mediterranean regions. In these regions large tracts of lands, on which forests and other woody vegetation had been destroyed by fire, are now being reforested or otherwise rehabilitated, using rehabilitation methods and technologies that ensure the stabilization of slopes, the selection of reforestation species (or other species to be planted or seeded) that will cope with the extreme environmental stresses in the region, notably drought.

A priority of rehabilitation will be the restoration of burned sites in watersheds/water catchment areas (e.g. around reservoirs) that are threatened by degradation-induced loss of water holding capacity or siltation (deposition and accumulation of land-based soils and sediments).

It must be noted that restoration of fire-damaged vegetation should be implemented only if efficient fire management capabilities will be in place and secure the protection of rehabilitation investments from uncontrolled fires.

The expertise available in the above-mentioned regions could be utilized to develop appropriate rehabilitation plans.

4.2.2 Capacity Building

(i) Capacity Building in Fire Management Planning

Fire management planning is essential to develop coordinated operational fire management structures and plans at local, regional and national levels. The inter-sectoral nature of the fire issue will require the inputs of all stakeholders concerned for the development of a coordinated strategic approach (which will also include regional cooperation). The upgrading of the existing fire strategy and fire management plans will require, among others:

- Review of legislation, regulations concerning national, regional and local institutional arrangements and responsibilities, including inter-agency cooperation
- Review of the implementation of laws and regulations/law enforcement related to the use and control of natural resources and fire

- Definition of gaps/shortcomings for further development
- Definition of responsibilities for fire management planning, fire risk assessment (identification and classification of risk areas and zones), reporting and evaluation
- Definition of the role of civil society in fire management

Considerable experience in the development of national fire management plans, guidelines and strategies is available in countries of neighbouring regions, e.g. in Eastern Europe. For instance, in preparation of EU membership, Bulgaria developed a national fire management strategy and procedures for regional and national fire management planning. Hungary developed advanced methods of fire risk assessment as a basis for fire management planning.

In the preparatory stage of their application to the EU, Hungary and Bulgaria were supported by so-called "Twinning" projects which enabled them to build capacities in fire management planning. The experience gained in this process would be available for use in other countries, e.g. in capacity building of leaders of fire services and other agencies in charge of planning and implementation of fire prevention and control. Joint training courses could be organised for representatives of agencies and local administrations from both sides of the Line of Contact.

(ii) Capacity Building in Fire Prevention and Preparedness

Fire prevention is a key for reducing the incidence of wildfires in the region. Since in the South Caucasus region the vast majority of fires are started by humans, capacity building in fire prevention and preparedness is essential. A number of areas need to be addressed, ranging from the involvement of civil society (community involvement in fire prevention, role of NGOs in awareness rising) to the application of advanced technologies. Joint training courses for representatives of agencies and local administrations from both sides of the LoC, as well as from other parts of the South Caucasus and South Eastern Europe, would include the development of national and local capabilities in:

- Fire early warning and fire danger rating;
- Fire detection, reporting and monitoring procedures and systems; and
- Public education and awareness building, involving civil society, including Community-Based Fire Management (CBFiM)

Wildland fire early warning systems, that have been developed by a number of European countries, the EU and neighbouring Russian Federation, are available for adaptation and local use in the South Caucasus region. The Global Fire Monitoring Center and its partners are available to provide relevant technical and scientific advice for technology transfer to the South Caucasus.

(iii) Capacity Building in Fire Suppression

Capacity building in fire suppression should have the highest priority. It must be linked closely with decisions made on the respective roles of agencies and civil society in fire management. In CIS countries and most neighbouring states, the fire services are in charge of fire suppression, often assisted by civil protection services or the military. This personnel is often not sufficiently trained and equipped to respond to wildfires burning in the remote areas and under extreme conditions. Special training packages are available that could be adapted to regional conditions and used to train fire services and other responsible personnel in:

- Wildland fire basics (fire behaviour, fire effects)
- Use of specialized equipment for wildland fire suppression (hand tools, small portable equipment), firefighting tactics;
- Inter-agency coordination; and
- Fire safety for fire personnel and civil population

New approaches in Community-Based Fire Management (CBFiM) would enable local communities to respond directly and swiftly to fire before fire service personnel or other authorities would arrive on the scene.

Capacity building, including training of trainers of fire services on both sides of the LoC would have priority in order to cover the areas of highest fire risk in the region.

Joint training would be an essential activity of confidence building in the region.

The region might draw on the experience of capacity and confidence building in the Balkan region. Between 2002 and 2005 two major multinational forest fire suppression exercises were organized in order to improve the cooperation between countries that had been in conflict before. The last exercise, the "Eastern European, Near East and Central Asian States Exercise on Wildland Fire Information and Resources Exchange - EASTEX FIRE 2005", was conducted in Bulgaria in 2005 to exercise international cooperation in managing a large-scale forest fire disaster that would require a multilateral response (cooperation of ground and aerial fire fighting forces of countries of the Eastern Mediterranean, Balkan and adjoining regions of the Near East and Central Asia). The exercise revealed the high potential and political significance of cooperation in the Balkan region and adjoining countries.

Regional training in fire suppression is invited to take advantage of the EUROFIRE project, funded by the European Commission and aimed at designing wildland fire management training materials for European fires services under the auspices of the GFMC and the International Association of Fire and Rescue Services (CTIF).

4.2.3 Modernization of equipment

Fire suppression in the region, particularly in Nagorno-Karabakh, is largely based on equipment, standards and training inherited from the former Soviet Union. The fire services are responsible for wildland fire fighting. Their equipment, however, is inadequate and obsolete. Fire truck models ZIL 130, ZIL 131, GAZ 53 and GAZ 66 are primarily designed for fighting of structural fires and may operate on flat and stable terrain only. Improvised hand tools do not meet the requirements of efficient

use in wildland fire suppression. Personal protective equipment is designed for fighting structural fires.

These inappropriate and outdated materials should urgently be replaced by specialized hand tools and mechanized equipment for off-road conditions, especially for the use in steep mountain terrain of Nagorno-Karabakh.

Priority should be given to equip highly mobile and flexible units for initial attack of fires, both for professionals and for local people (volunteers/civil population of villages). Personal protective equipment should secure the protection of professional and civilian wildland firefighters.

Personal protective equipment and hand tools for rural firefighting would include:

- Fire-safe clothing (light shirts, pants, helmet, gloves, goggles and boots)
- Fire shovels, rakes, cutting/scraping tools, axes
- Backpack pumps

Fire fighting vehicles with off-road capability and manoeuvrability on steep terrain would be needed to enable access of firefighting personnel, water and equipment to remote areas.

Conditionally, if a solid peace is established, the use of airborne assets for aerial fire suppression (helicopters with helibuckets, fixed-wing land and sea planes) would be a next step of upgrading the fire fighting capabilities. However, this should be envisaged only once efficient wildland fire fighting capabilities on the ground have been established. Aerial fire fighting would facilitate the control of fires burning on minefields and terrain contaminated by UXOs. Fires burning in mountainous terrain might be accessed faster by personnel transported by helicopter. Aerial fire suppression on steep and remote terrain would support ground operations.

The priorities of investments, however, should be determined in accordance with the progress of capacity building of ground-based fire management and availability of financial resources.

4.2.4 Joint fire research

There is a lack of fundamental knowledge about the response and recovery of flora and fauna in the South Caucasus region. A post-Mission evaluation of international state-of-knowledge in regional fire science revealed incomplete information on the fire ecology of the region.

The development of dedicated fire research projects would be imperative to explore the specific and yet unknown response of ecosystems and species to fire and the appropriate measures of rehabilitation of burned areas. Such a project would benefit from international support if implemented jointly between the universities located in the South Caucasus. This should include a university or an institute based in Nagorno-Karabakh.

The projects or a targeted programme could be supported by capacity building in fire research methodologies. Cooperation with specialized university researchers from the neighbouring countries should be envisaged, e.g. through the representatives of the academia of the UNISDR Regional South Eastern Europe/ Caucasus Wildland Fire Network. The Universities of Skopje (FYR of Macedonia),

Thessaloniki (Greece) and Trabzon (Turkey) are represented in the network and should be approached to support cooperative research activities. The Soil Science Faculty, Lomonosov Moscow State University, Russian Federation, may offer advice in the rehabilitation of drained peat lands affected by fire. The United Nations University (UNU) through the Global Fire Monitoring Center, its associate institute of the UNU Institute for Environment and Human Security (UNU-EHS) could also be approached.

4.2.5 Regional cooperation in fire management, water management and related environmental measures

Regional cooperation along the LoC is a key prerequisite for the reduction of the risk of fire incidents, reduction of wildfire hazard, response and efficiency of fire suppression and, most importantly, confidence-building.

It is self-evident that wildland fires are related to wider environmental issues and, in this respect, there is a need for more cooperation in the field of environment. According to the findings o the Mission, one of the highest priorities is the issue of water and irrigation, in particular the Sarsang-Tertar complex. Other issues, such as forests, biodiversity, natural resources but also issues of environmental governance should be addressed.

(i) Enhanced Communication and Cooperation along the Line of Contact including the Establishment of a Working Table of Experts

The control of the lands along the LoC by the armed forces makes an involvement of the armed forces in the prevention and control of fires imperative. Under the guidance of the Personal Representative of the OSCE Chairman-in-Office on the Conflict Dealt with by the OSCE Minsk Conference, the armed forces on both sides of the LoC should be encouraged to work out an agreement, procedures and technical tools for communication and cooperation between military units on both sides of the LoC. An agreement could include procedures for exchanging information on fires (detection, monitoring) and suppression of LoC-crossing fires. An agreement could envisage, among other things, the safety of both parties' firefighters when intervening in areas adjacent to the line of contact and mutual warning in case of fires.

The Mission initiated a dialogue between the sides at experts' level. In this respect, and in order not to lose the momentum, it would be important to envisage ways of keeping the dialogue alive. This could be done by establishing a permanent Working Table of Experts, under the guidance of the OSCE (the Personal Representative of the OSCE Chairman-in-Office on the Conflict Dealt with by the OSCE Minsk Conference) or another relevant international organization. The Working Table would discuss common problems, define common objective, work out procedures and methods of co-operation particularly in fire prevention and preparedness, as well as fire suppression and follow the implementation of agreed measures.

(iii) Co-operation towards Rehabilitation of Water Infrastructure and Enhanced Water Management

The need for the reconstruction of the water supply system in the areas around the LoC has been mentioned above. It is obvious that all parties would benefit from a restored water supply system. From the point of view of the prevention of wildfire spread and fire suppression a restored irrigation system with functioning infrastructures and the restoration of artesian wells would greatly improve the situation. The authorities of Azerbaijan and in "Nagorno-Karabakh" met by the Mission both underscored their willingness for cooperation in this regards.

All stakeholders in the region concerned would benefit from a dialogue to be initiated with the goal to restore the supply of water from the Sarsang and Khachen reservoirs to the lowlands on both sides of the LoC, to restore water canals and irrigation systems and to rehabilitate artesian wells and other water infrastructure on both sides of the LoC, aimed at improving water supply for agriculture, drinking water and water required for fire suppression.

Co-operation in this area could take place under the auspices of the OSCE in the framework of the Environment and Security (ENVSEC) Initiative.

6. Conclusions

- The fact that the Mission took place, essentially according to the itinerary determined throughout consultations at the OSCE in Vienna, and the fact that the Mission benefited from the presence and the very constructive contributions, on both sides of the Line of Contact, of the local experts appointed by the parties were already in themselves a success. It created goodwill, on the basis of which the Mission now proposes further measures of a confidence building nature consisting of initial high-priority and swiftly achievable steps followed by medium- and longer-term measures. These measures, taken as components or in an overall package, constitute the environmental operation as foreseen by the Mandate.

- All experts and authorities involved in the Mission unanimously agreed that the long, hot and dry fire season of 2006 provided the conditions for the occurrence and large-scale spread of severe fires on both sides of the Line of Contact. The areas burned have been extensive and the impact on people, the economy and the environment significant. On both sides of the Line of Contact, fires have been a matter of great concern and the Mission was told how all available means were used to stop the fires, albeit often unsuccessfully.

- The Mission is making recommendations on how to rehabilitate the fire affected areas. Furthermore, it outlines a series of actions and projects to prevent the recurrence of such fires. **The recommended actions are based on the view that environmental problems, including fires, ignore borders, conflicts and lines of contact and require co-operation of all actors concerned.** The Mission recommends in particular joint capacity building and training in fire management, fire prevention and preparedness and fire suppression as well as regional enhanced co-operation on both fire and water management issues, in relevant regional and international frameworks. Other recommendations relate to modernization of equipment and fire research.

Recommendations are also made for short-term initiatives for which steps should be taken immediately.

- More fundamentally, the Mission hopes to provide through its report a contribution to peace building in a region, where the fires of the 2006 summer have added to the already considerable human, economic and environmental cost of the conflict. The Mission's hope is that, further to its recommendations, fires might be transformed from an additional source of conflict into an opportunity for regional co-operation, confidence building and ultimately reconciliation. The Mission hopes that this opportunity will be seized upon.